THE VETERINARY RECORD

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Edited by WILLIAM HUNTING, F.R.C.V.S.

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IMPROVEMENTS IN THE A.V.D.

"The following letter has been received by Prof Owen Williams, Principal of the New Veterinary College, Edinburgh, in reply to inquiries made by him:—"War Office, London, S.W., September 14, 1903. Sir,—I am directed by the Secretary of State for War to acknowledge the receipt of your letter of 7th inst., and to acquaint you in reply that the improvements about to be introduced into the terms of service of the Army Veterinary Department are now in process of being embodied in a Royal Warrant which, when approved, will be duly promulgated.—I have the honour to be, Sir, your obedient servant,

H. THOMSON, Director-General A.V.D."

The above appeared on September 22nd in the Naval and Military Intelligence column of *The Times* In September, 1902, it will be remembered we had an assurance that the whole matter of the grievances of the A.V.D. "would be considered" by a Committee. The recommendations of that Committee were in the hands of the Secretary of State for War on April 8th. After five months we have indications of a further move—"that the improvements about to be introduced into the terms of service of the A.V.D. are now in process of being embodied in a Royal Warrant, etc." How long the War Office may require for the process of embodiment we cannot imagine, but when that is successfully surmounted these little improvements have a further gauntlet to run—of "approval." Possibly we may see the Royal Warrant in September, 1904. It is rather curious that these vague promises generally appear in September—just before the Veterinary Colleges open in October. Can it be that some one at the War Office selects the date for publication of *placebos* so as to anticipate nasty but truthful remarks at the College opening meetings?

We note that the letter is signed by Colonel Thomson, Director-General of the A.V.D. We should be the last to express a doubt as to the honesty of purpose of this gentleman, and we acknowledge his display of zeal and interest at all times in connection with veterinary progress. But we note also that the letter commences—"I am directed by the Secretary etc." so that the announcement contains not one word upon which the veterinary profession should build hopes. There has been so much evasion and delay, first in acknowledging any grievance, and next, when that was demonstrated, in promising any alleviation, that safety lies only in the exercise of a scientific scepticism until the Royal Warrant appears. Our advice to members of the profession is to continue stating our grievances to the Members of Parliament of their respective districts. Just now is a particularly happy moment to approach an M.P. Every vote may be wanted soon, and attention to a real and important though small matter affecting military efficiency will not be difficult to obtain. Our advice to recent graduates is still to wait—wait until the Royal Warrant appears, and then consider well whether the "improvements" render the service equal to other branches of the profession.

DISTEMPER EXPERIMENTS.

We should be grateful to any reader who could send us, or direct us to, a litter of healthy puppies about six weeks old.

HENBANE POISONING.

I received an urgent message from Mr. A. J. P—— to attend a cow which was described as being in a fit. I found the animal lying on her side and exhibiting marked symptoms and signs of nervo-muscular exaltation. The eyelids, in addition to the irides were much dilated, the eyes amaurotic and very bright. The pulse was full, temperature normal, respirations difficult and hurried, with a compressed groan emitted at the termination of each expiratory effort. There was also profuse salivation which might portend nausea, with retraction of the angles of the mouth to which I might aptly apply the term *risus sardonicus*. The muscles of the neck and extremities were in a state of tetanic rigidity and there was considerable abdominal distension (which no doubt augmented the abnormality of the respiratory act) while the stercoraceous and renal emunctories were entirely suspended.

During my examination the yardman approached with the information that a young steer was similarly affected, which proved to be correct, with the one addition that it was in a more complete state of sopor.

I ascertained that they had been grazing on some pasture which a few years ago was under cultivation by a firm of drug distillers. With these and other premisses I inferred it was poisoning, and my diagnosis—henbane. Both animals succumbed before any remedies could be applied.

The Autopsy did not reveal an iota of evidence, as no intelligible botanical distinctions could be made of the ingesta in the rumen or elsewhere. The verification of my diagnosis was subsequently proved by the discovery on the pasture of isolated tufts of the henbane plants, the leaves of which had been partially eaten off.

Houlton has said that the poisonous properties of henbane is augmented at a certain age of the plant; another writer whose name I cannot recall affirms it is the second year of its growth that the toxic effects are most potent. Herein this would coincide with the above two cases, about that period of time having elapsed since its cultivation scientifically for the manufacture commercially of the Extract of Hyoscyamus.

J. RANDOLPH WELSBY, M.R.C.V.S.

ECTOPIA CORDIS.

I enclose photographs of a half-bred Dutch calf (female) showing a unique case of ectopia cordis. The first was taken when the animal was twenty-four hours old, and the second at seven weeks. She was a full time calf and sucked and appeared fairly healthy the whole time, with the exception that respiration was somewhat hurried, and being moved quickly for a few yards caused a rather distressing cough.

The position of the heart, as will be seen from No. 1, was at the postero-inferior portion of the neck, a little to the left side and quite anterior to the chest. Pulsation could be distinctly seen at ten yards distance, and the shape of the heart could be felt by the hand. I counted the beats (which were really a prolonged thrill, and quite different to the ordinary feel of a heart through the chest wall) several times at intervals of a few days, and they averaged 120 per minute.

When about three weeks old another enlargement could be seen a little posterior to the heart, and to the right side, this increased considerably during the rest of the time she was alive, and also became painful to the touch.

The calf was killed at seven weeks old by cutting off its head; it was then blown up and laid on the block as shown in No. 2, and the head placed in position. On cutting through the skin and underlying tissues the pericardium was seen lying directly underneath; this was incised and the heart liberated, which was well developed and healthy, as also were the vessels attached. To the right of this lay a white globular swelling, in the photograph it is seen emptied of its contents. On cutting into this there escaped about a pint-and-a-half of pus, some of which can be seen on the sack upon which the carcase is lying. The sternum was then sawn through and the chest cavity exposed, which appeared to have its full capacity, but was almost empty, as the lungs were ill developed, each being only about half the size of one's hand.

The opening between the first ribs was sufficiently large for the heart to have been passed to and fro.

I conclude that death would have been soon caused either by the bursting of the abscess or by the pressure of that on the heart. The calf was never heard to bleat.

This animal came from a noted strain, her granddam was imported from Holland in 1889, the property of Mr. Fredk. Neame, Faversham. In less than eight years she had nine calves, of which six were bulls, and during that time she yielded 11,300 gallons of milk, or about 50 tons in weight.

For the photographs I am indebted to Mr. Gubbins, Faversham.

ERNEST MORGAN, M.R.C.V.S.

South House, Faversham.

NEW APPOINTMENTS IN THE R.V.C. OF IRELAND.

The Governors of the College have appointed Prof. G. H. Wooldridge, M.R.C.V.S., to the Chair of Medecine; Mr. J. F. Craig, M.A., M.R.C.V.S., to the Chair of Anatomy; and Mr. G. Ebrill, B.A., R.U.I., to the Chair of Chemistry.

ABSTRACTS FROM FOREIGN JOURNALS.

THE EMPHYSEMATOUS FŒTUS.—By M. G. DE BRUIN.

(Continued from page 166.)

Case 4.—On February 16th, 1902, a cow came in for treatment. The first labour pains occurred on Feb. 15th, in the morning, when she was standing for sale in the market. The delivery, which was momentarily expected, did not occur this day nor during the night, although the cow appeared perfectly healthy. The position remained the same till the morning, then the patient suddenly became soporific. In examination the animal had great trouble in standing. Temperature was 39·5° C., pulse very frequent, eating and rumination wholly ceased. Exploration showed a large emphysematous calf in the uterus. The presentation was a breech one; the presence of the gases of putrefaction under the skin was so great that the calf inflated the whole of the abdomen like a balloon. Hair easily came off, and stench was great. As the fœtal liquids flowed away the uterus closed on the calf. Whilst the cow was being removed in a float to a place about quarter of an hour's journey away she collapsed and died suddenly.

Case 5,—A case of twins, both of which were very emphysematous, was encountered on February 14th, 1902. The cow was brought in with the history that the previous day she had been delivered by an empiric of a windy calf. The fœtus was so large that embryotomy had been resorted to, but after delivery the cow strained violently, and for this straining and in consequence of her soporific state she was brought for my advice. Exploration revealed the fact that there was still a calf in the uterus. The calf lay in breech presentation, was inflated with gases, the hair fell out, and the claws would come off. It was possible to effect delivery after considerable hauling on the calf. After irrigation of the uterus and washing away a lot of chocolate-coloured exudate the animal stood up. Removal of the after-birth was not possible because all the cotyledons could not be reached with the hand. Internally camphor and oil of turpentine were given in the form of an emulsion. Although the emphysematous calf had been removed prognosis, on account of the soporific state of the animal, was unfavourable, and this was justified, for she died in the night, comatose, without a struggle. There was no rupture of the uterus, and the sudden death must be ascribed to poisoning by toxin of putrefaction. The quantity of the toxin produced was very great and the surface for absorption very extensive owing to the occurrence of twins.

Case 6.—This case, like case 2, was a premature birth of 7½ months. Although emphysema had greatly increased the size of this calf the cow's resistance to infection was great, as she was a very big cow. After infusion of warm water and considerable traction the calf came away whole.

In cases in which emphysema is slight, as in partus præmaturus, the cow stands the process well and the fœtus and afterbirth can be more easily got away.—*Ex. Berliner Thierärzt Woch.* G. M.

(To be continued.)

ROYAL COUNTIES' VETERINARY MEDICAL ASSOCIATION.

A meeting was held on Friday, June 26th, at the Clarendon Hotel, Oxford, the President, Mr. James East, of Aylesbury, in the chair; also present, Messrs. J. P. S. Walker, Oxford (hon. treas.); Percy Simpson, Maidenhead (hon. sec.); A. L. Butters, London; Geo. E. King, Abingdon; E. C. Howard, Newbury; and H. C. Jagger, Bicester.

Letters and telegrams expressing regret at inability to attend were read from Prof. Pritchard, and Messrs. F. W. Hanks, E. Percival Owen, S. H. Slocock, Coleman, H. G. Lepper, J. S. Hurndall, T. B. Goodall, H. G. Simpson, W. G. Flanagan, James F. Simpson, and R. P. Bull.

Other correspondence having been dealt with, the Hon. Sec. read the circular letter from the Central Veterinary Medical Association, containing a resolution addressed to the Secretary of State for War, as to the conditions and status of the profession in the Army Veterinary Department.

On the proposition of Mr. Butters, seconded by Mr. King, the meeting unanimousiy resolved: "That this Association entirely concur in the resolution adopted by the Central V.M.A. with reference to the action of the War Department."

New Members.

Mr. J. McI. McCall, M.B., C.M., M.R.C.V.S., London, Assistant Veterinary Officer at the Board of Agriculture, was proposed by the Hon. Sec., seconded by Mr. Walker, unanimously elected.

Mr. T. D. Hughes, M.R.C.V.S., of Woodstock, was nominated for election at the next meeting.

Instruments on Loan.

The Hon. Sec. presented a very satisfactory report as to the loan instruments belonging to the Association, showing that they had been used to the benefit of members. The Association has a very valuable set of lithotomy instruments. It was agreed that a full list of the instruments possessed by the Society should be in future printed at the foot of the agenda paper summoning each meeting.

Next Meeting.

It was unanimously agreed, on the proposition of Mr. Butters, seconded by Mr. King, that the next meeting of the Association should be held at 10 Red Lion Square, Holborn, as heretofore.

NOTES ON OOMPHALO-THROMBO-PHLEBITIS (NAVEL ILL.)

By G. E. King, F.R.C.V.S., Abingdon.

This Society perhaps has never before had presented to it a communication with such an ambitious title. No credit is due to me. It is to our worthy Hon. Sec. that the thanks of the Society and my own are due. Now that he has given us such proof of his powers I hope we shall be able to induce him to give us a paper at an early date.

While thanking our President for his pressing invitation to read a paper at this meeting I desire to disclaim any pretensions to the title of "paper" for these notes. If they do not come up to the Society's usual standard, or to your anticipations, I must ask your indulgence on the ground that the exigences of a country practice at this time of the year allow a busy man very little spare time.

Oomphalo-thrombo-phlebitis—I shall refer to the construction of this title, to which I object, later on—has a whole string of aliases. It is known as Navel Ill, Joint Ill, Joint Evil, Felon, etc., amongst breeders. Walley called it "Specific Arthritis," regarding the joint lesions as due to a specific cause. Robertson and Williams considered it of a scrofulous nature. Armitage gives a brief description of it under the name of Arthritis or Joint Ill. Fleming, in his "Obstetrics," gives an excellent description of the disease under the head of Arthritis. Several other authors have contributed to the literature of the subject under different headings, such as Tubercular Arthritis, Rheumatic Arthritis, Suppurative Arthritis, Umbilical Pyaemia, Umbilical Infection, etc. Numerous foreign writers, notably Bollinger, Roloff, Gmelin, Sohule, Lecoq, and others have given interesting and instructive accounts of the disease.

These numerous titles are both conflicting and confusing and do not impress intelligent men. Now we have some pretentions to consider ourselves pathologists, I think it is quite time that we discard such ambiguous terms as Felon and Joint Evil, and instead of using the terms of our forefathers adopt a more scientific way of expressing ourselves. I invite suggestions from you as to the nomenclature of the disease.

It is not a new or an uncommon disease. All of you, at any rate all those who practice in breeding districts, are more or less familiar with it, and I have no doubt have several cases at this season of the year. It is essentially a disease of young animals, foals, calves, and lambs are attacked. It is probably contagious but it is not a specific disease in the same sense as Glanders, Tuberculosis, or Anthrax. It is characterised by extensive changes in the joints and other organs due to infection at the umbilical cord. In my experience it is comparatively rare in calves, for although located in a dairy district for 10 years I saw very few cases. Perhaps our President will be able to give us some information on this point.

Etiology.

Almost as many theories have been advanced as to the cause of the disease as it has received titles. I think we may dispense with the older ideas, which to my mind are exploded, and more profitably occupy our time in examining the modern opinions on the subject.

Von Worz states that foals are born with the germ of the disease in them. If the germ develops quickly it causes abortion, if slowly, the foal is born apparently healthy, but falls a victim to the disease.

A most interesting abstract from a foreign journal appeared some time ago in *The Veterinary Record* of some experiments conducted by Hugo Sohule, Head V.S. to the Wurtemberg State Stud. According to Sohule the dam is the bearer of the infection; in the uterine discharges of the mare whose foals fell with the disease, the same characteristic bacteria were found as were present in the joints of the affected foals. Infective material in Sohule's opinion is conveyed from one mare to another by the act of covering, so that the mucous membrane of the womb becomes the *habitat* of the *specific* bacteria. Sohule describes the germ as a capsule coccus. His description, together with his method of staining, and the preparation of the cultures I will not weary you with. After reviewing its peculiarities he concludes by saying the organism of navel ill is a variety of the staphylococcus pyogenes aureus. The cultures when injected into mice killed in 12 to 24 hours; in rabbits in 2 to 3 days; in guinea-pigs abscesses formed, and they died at varying intervals, often after weeks, becoming greatly emaciated. When the bacteria were injected into the blood stream of foals the animals were affected with a disease which in the smallest particular could not be distinguished from the disease arising naturally. Coming from such an authority this information is entitled to every respect, but the point which struck me most forcibly was that the germs remain in a

quiescent state in the dam from the time of copulation to the birth of the foal. One would think that the organism or its products would set up sufficient irritation to cause some septic condition of the vagina or womb and so cause abortion long before the natural period of gestation was over. I wrote Prof. M'Fadyean upon the subject and asked for his valuable opinion. In his reply he says he thinks it possible for the foal to become affected in the act of birth by organisms present in the vagina of the mare, but he expresses the opinion that the disease is not caused by one organism alone but by a considerable variety of microbes, most of which are of the nature of saprophytes or dirt organisms. He adds "in most of the cases I have had the opportunity to examine I found small bacilli in the lesions and apparently responsible for them."

Some cases I have had this season have caused me to reflect upon this question of the bearing the dam has upon the affection in the foal.

A client of mine who breeds expensive shires has been unfortunate enough to lose several foals. The foals have either been born dead br have died within a week of birth. Apparently they have been as healthy as one could wish, with big, well developed limbs. Externally nothing abnormal was noticed with the navel, which was dry and had a shrivelled appearance, with no swelling, Upon opening the abdominal cavity a quantity of dark-coloured semi-purulent fluid was found, the umbilical vessels, especially the vein, were swollen and thickened, and filled with disintegrated thrombi and pus. The uterine discharges and the fœtal membranes in all the cases were unhealthy, and there were numerous small abscesses in liver substance.

Perhaps a review of the parts and the functions they perform will help to give us a better idea of the pathological changes which take place. The amniotic portion of the navel string in a full-time foal is of considerable thickness and length—about one-half the body length—and is irregularly spiral in shape. Toward the umbilicus it becomes thinner, and the boundary between the cord and skin is marked by a narrow, pale, non-pigmented ring. The outside covering is the common integument, next is a fibrous connective tissue ring from which septa are sent to embrace the different vessels, and between these is a gelatinous material known Wharton's jelly. The umbilical vein is placed anteriorly, the arteries posteriorly, the urachus between the arteries the umbilical vesicle a little anterior to the right artery.

The vessels with the urachus run direct into the abdomen underneath the peritoneum, which does not fall into the umbilical ring but bridges it over. The umbilical vein runs forward along the middle line of the abdomen to the anterior surface of the liver and opens into the vena porta, joining a single vessel which breaks up in the liver substance. The blood passes through the gland, enters the post vena cava by the hepatic vein, and so to the right auricle of the heart. There is no occasion to trace the circulation farther, as it has no particular bearing on the disease. The umbilical arteries, after entering the abdomen with the urachus, pass backwards and upwards over the sides of the bladder, and make a curve upwards and slightly forwards from that organ to join the internal iliacs. After birth circulation stops in all these vessels; the vein forms the falciform ligament of the liver, and the arteries the round ligaments of the bladder. Thrombi form, and if natural processes go on are organised, the internal coats of the vessels unite and the vessels as a blood tube are gradually obliterated. The vein in fœtal life carries arterial blood from the chorion to the fœtus and the arteries return the blood to be re-oxygenated.

The urachus at the navel ring is thin and dilates into a long spindle-shaped tube, the central portion of which joins the bladder. As the external portion of the cord shrivels up and the ring closes, so the inner portion of the urachus retracts and ruptures from the inside of the umbilicus, and forms the fundus of the bladder. The function of the urachus in fœtal life is to drain the urine into the allanatoid sac. The umbilicus is therefore the key of the position. Whether organisms enter before, during, or after birth, it is the strategical position that must be zealously guarded, and if disease appears rigorously attacked.

Symptoms.

Lambs, calves, and foals are affected by the disease, and the symptoms in each animal are almost identical, especially the premonitory ones. The first appreciable sign is the loss of animal spirits—the pure joyousness and exuberant movement of young life is gone. The foal does not gambol and frisk round its dam but lags behind in a listless, dejected way. The lamb crouches up in a corner of the fold or under a hedge where its instinct guides it to a sunny spot protected from the wind. In all animals there is the same lassitude and disinclination to movement. Perhaps the animal gets up wearily, and sucks—not so vigorously and ravenously or with the same butting action as it would do in boisterous health, but it still takes a fair amount of nourishment. It then wanders about in an aimless, sluggish way for a time, but soon lies down again and sleeps. This lassitude increases. The intervals between taking nourishment become longer and the amount each time it goes to the teat less; it rises each time with more difficulty, and the time it remains on its feet becomes shorter and shorter. It begins to have a careworn, anxious appearance the ears droop, the tail is whisked jerkily up and down and from side to side, the coat loses its comely sleekness, and the eye its brilliance and transparency. The animal is stiff at first and gradually —sometimes suddenly, be comes lame; the lameness increases and acute pain is shown by the affected limb being constantly drawn up and held away from the ground for a considerable time. The affected limb or limbs are flexed when standing to remove pressure, and this constant flexion ultimately leads to contracted and distorted limbs. It is not uncommon to see lambs which have survived the acute stages of the disease moving about on their knees, or with one leg permanently off the ground. Swellings appear in the neighbourhood of the joints, but this is not always so, and often some days elapse after the animal is noticed ill before they appear; the stiffness or lameness may first be attributed to some trivial accident, or to the dams having trodden on the young animal. All joints are liable to attack but those nearest the trunk, with the exception of the hip, are generally first affected. Exceptions to this rule are often seen.

The swellings are at first diffuse, more or less hard, very hot and painful, erratic in their character, and often migratory. It is not at all uncommon to find a swelling at the stifle one day which has moved to a hock or fetlock, or even to another limb, the next. For this reason the swellings are often attributed to rheumatism. They gradually become softer, the hair comes off at the most prominent part, a yellow serous fluid exudes, and if not lanced or ruptured by external violence the abscess bursts, discharging a quantity of pus often mixed with synovia. In the worst cases extensive sloughing and ulceration of synovial membranes and of the articular cartilages of the joints follow.

Marked febrile symptoms precede and accompany these joint changes. The bowels are very irregular, diarrhœa or obstinate constipation may occur, the fœces are changed in colour, often covered with mucus, and very offensive. The mouth is hot and dry and the breath faint and disagreeable. The respiration is irregular, always increased, but the number varies according to the pain experienced. The temperature is always

high ; I have frequently recorded temperatures of 106, 107, and a few times 108. Owing to the pain suffered when the limb is used the animal moves very little, and often refuses to rise and has to be assisted to get up to take nourishment. Urine may dribble from the navel, or even run from it in a considerable stream. On examination the whole navel is found to be wet, and the edges and interior of a grey or dirty yellow colour, somewhat resembling a piece of used chamois leather, instead of the dried shrivelled appearance it ought to present. The umbilicus may be swollen, with a semi-purulent fluid exuding, or an abscess may have formed. In bad cases the course of the umbilical vein can be traced along the floor of the abdomen by a distinct thickening, and the liver is tender and enlarged.

Or the navel may be dry with no external indication of anything wrong. One is often misled by this, for often there is an abscess beneath.

In cases which occur soon after birth joint symptoms are not so common as in older animals. There is dullness, high temperature, perhaps a few colicky pains and death occurs quickly.

Brain symptoms and pneumonia are sequels. The inguinal glands are often tender and enlarged, and abscesses form in connection with them or in the femoral space. The lymphatics are large and corded.

The duration of the disease is indefinite. In young animals, in the acute form it lasts from 24 hours to three or four days. In older animals when the disease, enters upon second stage and joints are affected and abscesses form, from two to four weeks to as many months. A bad case I had last season which, after attending some time, I advised the owner to destroy, as I felt sure the foal, although it recovered from the acute stage, would become a confirmed and useless cripple. It improved so much afterwards that it encouraged him to persevere and he thought there was a great chance of the foal coming round. He kept it all through the winter and spring, and only the other day sent word that he had had to send it to the kennels as it had got so very much worse again.

I have been connected with three or four large breeding establishments and my experience is that it is advisable to destroy when joints are badly affected and there is stiffness and contraction of the limbs. These animals become useless piners, and very seldom repay the trouble and expense they have caused.

Post-Mortem Appearances.

In making a post-mortem, and before opening the abdomen, one is struck with the changes which have taken place at the navel. Instead of the stump of the umbilical cord resembling a piece of dried stick, the white navel ring contracting and being covered with longitudinal fissures, the parts are swollen, wet, and puffy, and the contained vessels and urachus are pervious.

The natural process of organisation of the thrombi formed in the vessels when the cord is ruptured directly after birth does not take place. Instead of the clots being firm and consistent, and the coats of the vessels gradually closing round them, puriform softening and disorganisation gradually takes place, cheesy material or pus being formed. This process extends up the vessels until the diseased clot is washed by the circulating blood and pieces are detached and carried to other parts of the body by the blood stream, there to form focus of septic embolism or an abscess. These septic emboli, or the germs themselves, are principally arrested in the joints and lymphatics, and give rise to the joint changes and abscesses. Other organs are likely to become involved, *e.g.* lungs, liver, and secondarily, mesenteric and other glands.

A description of a bad case I had some time ago will serve to illustrate the nature of some of the lesions met with, but of course this case is somewhat exceptional. The patient was a three-weeks-old foal and was lame on the near hind limb ; the hock was swollen and painful, but the foal took nourishment readily and appeared in fairly good health. The mare was said to have been seen to bite off the end of the cord, but no urine had escaped. Two days later an abscess formed in the hock and burst, and a quantity of pus mixed with synovia escaped. Abscesses also formed in the off-hind and near-fore limb. The foal died a fortnight after being first seen, and I made a careful post-mortem at which Professor Axe was present. An abscess had formed in the inner navel ring and purulent softening of the thrombi in all the umbilical vessels had taken place, the material nearest the navel being of a cheesy nature. Where the umbilical artery is given off from the internal iliac a large thrombus, measuring two inches in length and as thick as one's thumb, was found. The central end was bright red, the distal end lead-coloured, soft, and purulent. An enormous retro-peritoneal abscess, measuring 16in. by 12in., was located on the left side of the spine (left sublumbar region) adhering to the cæcum and colon, anteriorly in connection with the posterior surface of the liver, and extending backwards to the pelvis. It enveloped the left kidney, and contained a sero-purulent fluid with masses of spongy, flaky fibrin floating in it. It had gradually extended its way forward, separating the peritoneum from the psoas muscles in its course. The off-hind limb was generally swollen, the muscles inside the inguinal region were flaccid and watery, the muscular fibres being very fragile and infiltrated with inflammatory products. The femoral space contained a large quantity of thick, purulent matter, and the muscles bounding it were separated from one another by it.

The off hock was swollen, and on the synovial membrane were extensive granulations, with here and there isolated grey patches. On the articular surface of the astragalus were a number of reddish brown spots, somewhat resembling those seen on the navicular bone when diseased, indicating degeneration of the articular cartilage and the preliminary stages of ulceration.

It is particularly interesting to know that children are affected with a disease which produces changes almost exactly analogous to those I have described. Holt, in his well known work on "Diseases of Children" under the head of diseases of the umbilicus gives a list of the lesions produced by the introduction of streptococci pyogenes aureus. 1. Omphalitis, with gangrene of navel. 2. Inflammation of vessels of umbilicus, which contain septic thrombi and pus. The umbilical vein affected along its entire course from navel to liver. The results are :—Hepatitis with suppuration ; pneumonia ; peritonitis ; joint suppuration ; erysipelas; parotitis ; multiple abscesses ; umbilical arteries more often affected than umbilical vein.

With reference to the construction of the title I consider it ambiguous and cumbrous ; it sounds important and very scientific, but it does not give an exact or sufficient idea of the disease. The disease is something more than inflammation of the navel and vein and thrombosis —which, moreover, is a perfectly natural process. I do not regard the tangle of two diseased conditions and a healthy one desirable. I think Umbilical Pyæmia or Umbilical Infection a more correct title for the disease.

Treatment.

When once the disease is well established treatment is generally unsuccessful. Unless we are called in at an early stage—which unfortunately for ourselves and our patients is seldom, our chance of success is very small. It is better in bad cases to advise the owner on this point. These remarks apply to foals. Lambs of course can be fatted for the butcher.

The disease is to a very large extent preventable ; prevention is the only way of successfully combatting it. I

always discourage a foaling box. These when used year after year, often without being properly cleansed or disinfected, become a perfect menagerie of germs. The wonder is that mares or foals ever emerge from these dens alive. Ewes should never be lambed two seasons in the same fold. I know the choice of a foaling place is a difficult matter on a farm where the accommodation is limited, but whatever place is used it should be carefully seen to each time after use. All old litter should be removed, if possible burnt, the floor and walls cleansed, washed, and disinfected. Pregnant mares should be kept apart from mares with foals at foot, whether diseased or not, and of course diseased animals should be isolated.

So I will lay down four points of treatment: 1. Treatment of the mare. Daily irrigation with warm lysol solution for seven days; change into a fresh box daily. [This of course is impracticable on an ordinary farm and also unadvisable]. 2. Hygiene of stable. 3. Treatment of foal's navel. 4. Disinfection of male organs of generation.

The treatment of the navel I regard as the most important point of treatment. As soon as possible after birth the foal should be cast, the umbilicus and surrounding parts disinfected and the navel securely ligatured. I use ordinary narrow tape, boiled, the same as I use for sutures. This I tie tightly round the navel about ½ an inch below the white band, and afterwards apply a mixture of boric acid and iodoform in a very fine powder by means of an indiarubber blower. I leave the blower with instructions to use it twice a day for a week all round the navel, ligature, and surrounding parts. This forms a nice covering to the part until it falls off, it is easy to use, it saves the trouble of handling and casting the foal, and it can be blown on while the animal is sucking without his appreciating that anything is being done; and because it is easy to use men will use it. If there is the slightest indication of the navel being wrong the foal should be thrown and the part thoroughly examined. If discharge is present it should be syringed out with chinosol or some other germicide. Some nine or ten years ago I had charge of a large stud of thoroughbreds and gave the treatment advised by Gmelin in his very instructive article, to which I am much indebted, a trial. Whether some of the details were not properly carried out, or the attendant did not exercise sufficient care, I cannot say, but it was not successful in my hands. I had an infinity of trouble, and found it quite impracticable. It was this failure which led me to adopt the simpler method I have described, and which, as it has stood the test of practice for some years, I can thoroughly recommend.

On the 2nd of this month (June) I was called to a week-old foal with a navel considerably enlarged and discharged a nasty purulent material. I thoroughly washed out the cavity with chinosol, removed all the hair surrounding the part, applied a ligature tightly above the swelling, and dusted powder over the whole. In the course of a week the part dropped off, leaving a healthy granulating surface which has since healed without the slightest trouble.

I attached the greatest importance to ligaturing the cord as early as possible, whether the navel is diseased or not. If diseased, or in cases of pervious urachus, I syringe out the cavity with chinosol and get a ligature on at once. The entrance of further germs is stopped—a most important point—the air is cut off, and the natural resistance of the animal may overcome germs which are within, and start, or re-start, natural processes.

When, owing to extensive sloughing and disorganisation, as in cases of prolonged pervious urachus, ligaturing is impossible, I syringe out the cavity, and after drying apply a strong blister all round the navel, and I am not particular if the blister goes into the umbilicus; or I have applied the actual cautery with the best results. Somewhat heroic treatment, some of you will say. Undoubtedly, but it is successful when all other means have failed. The object is to stop the unhealthy necrotic processes and substitute an active healthy action in the parts.

Mr. Tutt, in a paper read before the Southern Counties V.A., reports two successful cases treated by injecting one dram. of formalin in equal parts of water once a day for six days into the structures surrounding the affected joints. Mr. Hewetson, in an interesting article in *The Record*, also speaks of formalin as a local dressing to the umbilicus, and says of it "especially serviceable in open urachus."

V.S. Gott, of Hanover, describes the successful treatment of the disease by the injection into the jugular for three successive days of 80 grammes of a ½ per cent. solution of argent. colloid Crédé, and by washing out the diseased umbilicus.

The removal of the diseased animals to comfortable hygienic surroundings, with plenty of good, nourishing, digestible food is a *sine qua non*. Such medicinal agents as pot. iodid., hyd. biniodid, iron, and cod liver oil may be given. Personally I give hyd. biniodid, or pot. iodid. Avoid lotions and poultices to the navel. The skin surrounding the navel, especially in colt foals, is often already tainted and soiled by urine and coming in contact with wet litter, and does not require any extra moisture.

In conclusion I must apologise for inflicting myself on you to such an extent. I did not intend when I started to run to such a length, but it is difficult to condense so much matter. If I have wearied you I hope you will retaliate by freely criticising my remarks. The disease is well known to you all, and I am anxious to hear your views upon it.

Discussion.

The President said they had listened to a most instructive paper on a very important subject, and he was sure they were very much obliged to their friend Mr. King for the trouble he had taken in preparing it. It occurred to him that, as so few members were present, it would be better that Mr. King's paper should be printed and circulated among the members with a view to its full discussion at the November meeting of the Association.

Mr. Butters thought it would be paying Mr. King a poor compliment to attempt to discuss so very interesting and valuable a paper at that poor meeting, and begged to move a resolution carrying out the views of the President.

The Hon. Sec. seconded the motion, which was supported by Mr. Howard, and carried unanimously, and it was accordingly ordered that the paper be printed and circulated among the members.

The Hon. Sec. had much pleasure in proposing a very hearty vote of thanks to Mr. King for the most able paper he had brought before them that day, and to which they had listened with the greatest interest. He agreed that the points adduced wanted well thinking out before they could be adequately discussed. (Hear, hear.)

Mr. Jagger cordially seconded the resolution.

The President supported the proposition. The paper was one of the most interesting he had ever heard read. (Hear, hear.) The motion was carried by acclamation.

Mr. King said the notes he had put together were entirely the outcome of his own personal experience, which had been exceptionally large among foaling mares in extensive studs. Several of the ideas he had given had been well weighed out, and he assured the meeting they were quite practical. Mr. King closed by moving a cordial vote of thanks to the President, and expressed regret for Mr. East's sake that the meeting had been so sparsely attended. (Hear, hear.)

Mr. BUTTERS heartily seconded the vote, which was accorded with warmth.

Mr. EAST, in reply, said he would have liked, certainly, to see a much larger meeting, but at that time of year circumstances often prevented members from attending. He hoped that next November, in London, he would have the opportunity of presiding over a much larger gathering. (Hear, hear.)

[Publication of this report has been delayed, Mr. King having been unable to forward his MS owing to pressure of work and ill health.]

NORTH WALES VETERINARY MEDICAL SOCIETY.

The annual meeting was held at the Wynnstay Hotel, Wrexham, on September 7th, at 1 p.m. The President occupied the chair. The following members were present: Messrs. Hugh O. Richard, Corwen (President); R. Price, Tarvin (Vice-president); Edwards, Chester; W. Hughes, Cærwys; O. T. Williams, Llangefni; R. Jones, Towyn; and T. C. Howatson, St. Asaph. Visitor, Mr. J. Share-Jones, Veterinary College, London.

The minutes of last meeting were read and confirmed. The balance sheet for the past year was read and passed.

The SECRETARY spoke at some length on the subject of subscriptions in arrear, after which it was decided to read out the names of members who were in arrear with their subscriptions at each meeting.

ELECTION OF OFFICERS FOR THE ENSUING YEAR.

Mr. R. PRICE was unanimously elected President on the proposition of the retiring President, seconded by Mr. Hughes.

Mr. R. JONES, Towyn, was unanimously elected Vice-President, on the proposition of Mr. O. T. Williams, seconded by Mr. Howatson.

The HON. SEC. (Mr. O. T. Williams) tendered his resignation of the office on the ground of his health being very indifferent, and he proposed that the duties of Secretary and Treasurer be put into the hands of one member for convenience, he begged to nominate Mr. Howatson as his successor, and for the duties of Hon. Treasurer. Carried unanimously.

It was proposed, seconded, and carried that the Hon. Treasurer (Mr. H. Williams, Ty Croes) be written to, pointing out that the members present hoped he would not think they had slighted him in any way by combining the duties of Treasurer with that of the Secretary, and convey to him the Society's best thanks for his past services.

The PRESIDENT expressed regret that Mr. Williams could not carry on the duties of Secretary, and proposed a vote of thanks to him for excellent services in the past, and for being the originator of the Society; this was seconded by Mr. Jones and carried unanimously.

The President remarked on the small attendance and said that this meeting had been arranged at Wrexham to give the members of that district an opportunity of attending, but not one of them had put in an appearance. He thought every member of the Society ought to make a great effort to attend the meetings. These remarks were endorsed by all present.

The minutes of the last meeting were read and confirmed.

Letters of apology for non-attendance were read from Messrs. John Roberts, E. P. Edwards, C. Cartwright.

NEW MEMBER.

Mr. W. F. HUGHES, Denbigh, was elected a member on the proposition of Mr. Howatson, seconded by Mr. Richard.

SOME INTERESTING CASES.

By W. HUGHES, M.R.C.V.S., Caerwys.

Mr. Chairman and Gentlemen,—When I promised to write a paper for this meeting I looked upon it as a necessary duty (to be done) as nearly, if not all the members, had supplied one. I couldn't think of anything more practical and likely to draw forth a good discussion, which is the chief aim of a paper of this kind, than a series of interesting and to me unusual cases which have come across my path these last few years. I hope that you will also find them interesting, and that a good discussion will follow.

ROARING AND THORACIC CYST.

The first on the list is one that would have made you put on your thinking caps (if you had seen her alive) as to the cause of the symptoms produced—in fact it is the only one of its kind that I have had the good luck to see, and I may say the same for the late Mr. T. K. Williams.

January, 1894.—A brown carriage mare, aged, very fast, had been working for 7 or 8 years, perfectly healthy in every respect, and often seen by us on the road in passing. One day, when out in the carriage (double harness) she stopped, became very excited, began to tremble, signs of suffocation appeared, roaring, etc. She was immediately taken out of harness, and in a few minutes all symptoms had disappeared, and she was driven quietly home. Mr. Williams saw her a day or two after; examination revealed nothing abnormal, mare perfectly healthy to all appearance; eating, etc. She was taken out of the stable for a trot up the drive, when after going 50 or 60 yards the symptoms mentioned appeared, and in addition she fell down. Difficult inspiration predominated, the heart in the meantime could be distinctly heard, quick and fearfully irregular. Mr. Williams was very much puzzled as to the cause, or rather how the roaring was produced, and suspected some pressure on laryngeal nerve supply. She had to be assisted to the stable where she came round in a short time. She was left in a loose box for a week, when we both saw her. Coachman had seen nothing wrong during the interval, and clinical examination detected nothing. We had her out, and as usual after trotting some yards the same symptoms appeared. She was taken back to the stable, where she soon settled down. We decided to try tracheotomy as an experiment, also to gain time. Mr. Williams went to the house to speak with the owner about her; during his absence, some 5 minutes, the mare became excited from some unknown cause, the usual symptoms quickly appeared, she began to roar and fight for breath, rock, and roam about, until she fell down. Roaring increased, and death ensued in a very short time, six or eight minutes from asphyxia.

A post-mortem was made straight away and revealed a large cyst at the base of the heart and large blood vessels exerting pressure on the left laryngeal nerve, thereby causing the symptoms of suffocation. The cyst had very thin walls and contained about half a pint or more of serous fluid. It must have been of recent origin as the mare worked as usual up to 12 or 14 days of death.

There is no doubt that the cyst also interfered with the action of the heart on being exercised. The laryngeal nerve was stretched around the posterior aorta and the cyst which lay in front. It would be interesting to know whether tracheotomy would have been successful. We believed that it would, but there is to be considered the danger that the cyst, instead of being absorbed, would have gone on increasing and when the mare was exer-

cised caused syncope, and probably death. I must leave that as a debatable point.

Gloss Anthrax (?)

The next case, or cases rather, are ones that I want information about, gloss anthrax they are, or first cousins. I have met three since Christmas, all died ; no post-mortem was made. We did intend sending the head of one up to the College, but pressure of work at the time prevented a post-mortem being made. I have seen a great many such cases, but can't call to mind a single recovery.

Symptoms.—The patient is attacked rather suddenly ; head, lips, eyes, and cheeks swollen, saliva flowing rather freely, sometimes the swelling is confined to one side of face, other times general, the submaxillary glands enlarged and very painful, head hanging down. Pulse varies ; in some cases there is nothing abnormal about it. Temperature, again, is not high in the beginning, usually about 102 F., and it rarely reaches an excessive height ; 104 F. as far as I can remember is the highest recorded by me. On examination of the mouth the tongue is often found congested, enlarged, and with purple coloured vesicles on its different surfaces. The mucous membrane ot the mouth altogether is congested, and often vesicles are found on it ; these vesicles in a few hours burst, leaving nasty looking ulcers ; the saliva is then bloody looking and foul smelling ; the gums are often found swollen, and in two or three cases I remember removing with my fingers two of the molars, the odour of which was very disagreeable.

On looking over some old notes I came across the following case which is typical, with the exception that the tongue was normal. Cob mare, four years old, found one morning swelling about the nostrils and eyelids. We saw her the following day, and found the head very much swollen, especially the right side, both eye and nostril on that side closed by excessive swelling, there was a discharge from that nostril that smelled very badly, and hung in a long flake (no blood was mixed with it) a good deal of serum was also running from it, there was no discharge from the left nostril, but there were numerous little spots, light purple in colour, on the mucous membrane ; submaxillary glands were swollen and painful. Respirations normal ; temperature 101 F. Pulse varied; in one minute it would be 60, in another 52, or perhaps 56. In this case the tongue was normal, no injury or wound could be detected. Diagnosis of course was blood poisoning, cause not known, unless blame could be settled on the dung hill, which came right up to the stable door ; there was also a stagnant pool of drainage from the manure, we blamed that. She died in two days. Sometimes these cases live three or four days, the swelling always increasing. Treatment with us has had no effect. Tracheotomy, head slung up, and mouth continuously worked with a padded stick, to disperse or reduce swelling, cold and hot water alternately. Pot. iodide, quinine and iron, pot. chlor., antiseptic gargles have been amongst the remedies tried. In the next case I intend to try intravenous injections of iodine, and subcutaneous injections of formalin locally. Williams' "Medicine" gives very little information, it is just mentioned as a form of anthrax. Robertson gives a fuller description and has seen a few recoveries, he recommends the application of strong carbolic acid to the vesicles after opening them. Perhaps in the discussion one of you might be able to tell us of a successful case, but I always have looked upon the animals as done for. I have always failed to find a wound or other cause to account for the symptoms. Perhaps the cases have been too far gone for examination, although in some they have been seen the first day attacked. Great care has always been taken in the disposal of the carcases ; six feet holes, lime top, and bottom. The stable or box thoroughly cleaned and disinfected. I have never seen two cases in the same stable, so can offer no opinion as to its infectious or contagious nature.

Tumour in Nasal Cavity.—Necrosis.

The subject of the specimen before you was a well-bred Shire filly, rising three years, bought along with another unbroken. Nothing wrong was noticed until she was taken in hand to be broken, some four or five weeks after purchase, when she was found to make a noise on being excited or galloped. I was called in and on examining her found that very little air could enter the right nasal chamber, thus causing her to make a noise on being exercised. On passing my finger up I could just reach the distal end of a smooth growth. Diagnosed a tumour (without any difficulty) filling the nasal cavity, and probably the sinuses of the right side of face. I had the mare brought over to me for operation, she was cast and chloroform given (as I had a London Final year's student staying with me at the time). The hair was cut as closely as possible, two incisions were then made through the skin, about 3½ inches apart, covering the nasal, frontal, and maxillary bones, the muscles lying underneath, dissected from the bone, and pushed aside, the skin was then lifted like a flap backwards which left a large space for operation. I then trephined through the nasal bone in two places, when we found that we had a stiffer job than we bargained for. The frontal bone was then trephined in two places and the intervening bone, both nasal and frontal, cut away with a bone forceps, when we had an opening five or six inches long and fully three wide. The tumour was then found to completely fill the entire cavity, both the superior and inferior turbinated bones having been absorbed. It was impossible to pass the finger between the bone and the tumour so as to find, if possible, where it was attached. The tumour was cut through in two with a sharp bistoury, which separated a large piece. The other part was removed with a probe-pointed bistoury in sections, the bistoury breaking during the operation. We searched, but failed to find the broken half. The bone to where the tumour was attached could easily be felt deep down in cavity, felt very rough, so it was scraped with a curette. The cavity was cleansed carefully with tow and the patient allowed to come round, after having been down fully an hour. She walked well to the stable, about 100 yards distant, where she started to breathe heavily, became unsteady on her feet and ultimately fell down. She struggled to her feet and we got the men to steady and keep her from falling while I attempted to give her a good stimulant, but it was impossible to give it and for her to swallow, and as a last resource I gave her injections subcutaneously of caffeine, which altered her in a few minutes. She received a second injection in fifteen minutes, after which she settled down nicely. While we were attending to the mare a dog belonging to one of the men assisting swallowed the tumour which had been put in a bucket for safety. I felt the loss, as we intended sending it up to College for examination. It was of a gritty nature, and required some strength to cut through it.

After thoroughly cleansing the nasal cavity and wound, the flap of skin was let down and sutured. After treatment consisted of washing out the cavity through the nostril, and iodoform used with an insufflator. She did well for nearly two months, made no suspicion of a noise on being galloped, when a nasty discharge started, which continued. She was cast again and opened over the seat of the first operation. I may say that I was only half satisfied as to what had become of the broken half of the bistoury, and when the discharge appeared I suspected that it was hidden somewhere in the bone, but of course kept that to myself. On examination of the cavity I thoroughly satisfied myself that it couldn't possibly be there. Suspecting the teeth as having something to do with the mischief—although numerous

examinations of the mouth failed to lead me or show anything very much wrong, and she ate her food all through quite normal—I trephined through the maxillary bone, opposite to where the tumour was attached. Finding the 3rd molar (I took it to be the 3rd molar at the time) looking black and caried it was punched out. The post-mortem proved that it wasn't the 3rd molar that was punched out, the fang reached right up, as you can see on the specimen. In passing, you no doubt have read how easy it is to punch molar teeth out. Well, I have had occasion to operate on three cases and have always found them operations one would sooner shuffle out of. Perhaps mine have been exceptions, or I have been too humane and not hit hard enough. My cases were all under chloroform, or I would have been very sorry for the poor beasts, for it must be a fearfully painful operation. It is a pity that we can't always be as wise *before* the event as *after*. How nice it would have been if I had only known that it was the fang of a molar tooth that was projecting into the nasal cavity. The result would not have been different—for I consider that it would have been impossible to punch that out, but I would have destroyed her sooner without a second operation. During the second operation, finding the state of things so bad—the entire maxillary bone diseased and spongy, I determined to destroy her, which was done a day or two after. You will notice a hole over the 4th molar ; there was a fistula present there, which appeared about a month after the first operation, with a stinking discharge pointing to teeth or bone, so at the second operation I opened and enlarged it, and finding caries or necrosis present there it finished me, I had had more than enough of her.

A Doubtful Case—Glanders ?

An aged grey hunter, bought the end of last season, looked as if he had had a hard season, being poor. When taken out of the box at the station the groom noticed that he was coughing very badly and had a discharge from the nostrils, especially the near one. I was consulted about him. Examination showed pulse, temperature, and respirations normal, coughed very much after exercise, discharge from near nostril the colour of glue, and in flakes ; his eyes were peculiar, being bare of hair around them, and a sticky discharge accumulating in the corners ; there was also a discharge from the sheath, examination of the penis revealed nothing definite only an accumulation of the discharge at the point or fold of membrane under extremity of penis. The sub-maxillary glands varied, sometimes they would be enlarged and painful, other days normal. The mucous membrane of the nose is always a peculiar bluish or leaden colour. His appetite is enormous—he eats as much as any two horses ; wasting considerable ; no thirst or excessive urination present. He was put on a tonic treatment. No good ! Then we treated the symptoms, *i.e.* cough etc. No good again. So I decided to leave him alone for a week and then test him with tuberculin. His temperature was taken night and morning. It only went is high as 100 F. on one taking, keeping at 99 to 99½ all the time. He was injected on July 15th at 10 p.m., when his temperature was 100¾ F.

July 16th.—	7 a.m.	102
	10 „	102½
	1 p.m.	102½
	4 „	102¾
	7 „	102½
	10 „	102

Well, there was nothing very definite about the test, and at the same time it was suspicious. In a fortnight's time he was tested with mallein. I am sorry that the chart has been mislaid (Mr. Locke, of Manchester, has a copy), but it will suffice if I tell you that the temperatures after injection coincided almost exactly with the temperatures after the tuberculin test ; but the local reaction was a prominent swelling measuring 7½ inches by 6½ inches, then it tapered off right up to the parotid region, and down to the point of the shoulder (the injection was made in the neck) which took over a week to disappear ; the horse could hardly bear you to look at it, let alone touch it. I know that many high authorities would have thought that the local reaction was quite sufficient to prove that he was glandered, in fact many depend upon the local reaction, and don't trouble about the thermic reaction, but I looked upon it as doubtful, and had Mr Locke, senior, Manchester down in consultation, who thought it very remarkable that the temperatures should have been identical in both tests, and if it hadn't been so he would have looked upon the mallein test as definite. As it was he looked upon the reaction with very grave suspicion, so we have decided to test him again for glanders. The patient is now on the grass, having good feed, and seems to be holding ground. He is now having 2 drs. Pot. iodide twice a day. I am sorry, gentleman, that he hasn't yet been tested the second time for glanders, but the owner, or rather the owner's wife, pleaded that he should be turned out for a month to see what he would do before testing again. At the same time I think that there is plenty about him to raise a discussion. I am living in hopes of making a post-mortem on him some day.

The photographs submitted are those of a monstrosity which I came across some 4 years ago. The case happened in a big Shire mare, too big for my liking. Luckily things turned out nicely ; Pollock's spring bands gave me valuable assistance in the business, and the mare did well. The smaller card tries to show the position of the fœtus *in utero*, but the right fore leg was more bent, and the lower jaw pointing more to the stifle.

That, gentlemen, makes up my list, and I trust that you will discuss them thoroughly as there are two or three problems that require solving. If they are solved it will help me materially in the future and possibly yourselves.

Place of next meeting.

Mr. Price proposed, and Mr. Hughes seconded, that the next meeting be held at Bangor, at which Mr. Share-Jones has consented to read a paper : the choice of subject being left to him.

Votes of thanks to the Chairman and Essayist terminated the meeting.

T. C. Howatson, Hon. See. & Treas.

THE TRANSMISSIBILITY OF TUBERCULOSIS.

Berlin Congress.

At the International Congress of Hygiene this subject was discussed after a *resumé* of two long papers had been given by the authors. Other papers relating to tuberculosis had been read in different sections, but for the purpose of considering the question of the transmissibility of bovine disease to man the Bacteriological and Hygenic Sections sat together on Saturday, September 5th. This meeting was presided over by M. Denys, Professor at the University of Louvain.

M. De Jongh, Professor at the University of Leyden, read a report upon the identity of tuberculoses. After reference to the discovery of Koch (who, as is known, has declared that bovine tuberculosis is not transmissible to man) the speaker went on to say that in his opinion the bacillus of human tuberculosis is identical with that of bovine tuberculosis. The last named is more virulent than the former. The experiences of Koch are, however, not confirmed by other experimentalists. It is impossible to distinguish the bacilli ; one can only ascertain a difference in virulence. Quite recently in Berlin cattle have been infected with human bacilli.

According to M. De Jongh, bovine tuberculosis presents danger to man as much by the use of milk as by inhalation of tubercle bacilli. The speaker infers that the human bacilli and those of mammals are identical. The whole world expects from this Congress a solution of this question. In the meantime the world may remain calm. Koch's argument has not been justified. The Belgian Government as well as others will do well to continue the struggle against tuberculosis.

M. GRATIA, Professor at Brussels, author of a long report, sustains his conclusions by the results of a series of very recent experiments. He agrees with M. De Jongh as to the identity of the tuberculoses. The degree of virulence is not sufficient to distinguish them. The human bacilli and those of cattle are not alike, the ground for culture being very different. There are, however, some resemblances, sometimes bacilli have been found in man resembling those of cattle; but they were bacilli which had been recently introduced and which had not yet been perceptibly modified. One can also prove the identity of the tuberculoses by means of tuberculin. Both the human and bovine bacilli have been known to react against tuberculin. It is true that it has been proved that guinea-pigs inoculated with human bacilli live longer than those which had been inoculated with bovine. Generally speaking this is so, the lesions are less grave, there are even less bacilli, but on the main point the lesions are the same and on post-mortem it is impossible for anyone not warned to distinguish whether the disease was communicated by man or beast. Other experiments made upon dogs and cats have not been decisive. The transmissibility of human tuberculosis to cattle is undoubted, it has long been proved. In 1868 M. Chauveau, who is present to-day, proved that human and bovine tuberculosis were of the same character. The speaker mentioned numerous learned authorities who are of the same opinion. It has been found also in bacteriology that the quality of the different cultures of bacilli is the same, and by experiments the transmission of human and bovine has been effected on cattle, pigs, fowls etc.

M. GRATIA then announced that an animal that he had himself inoculated with virus taken from a child, had just died of tuberculosis. The lesions were enormous. He went on to quote experiments made upon monkeys and other animals. They were all conclusive. He quoted notably experiments which he had performed upon monkeys. He gave them tuberculous material taken from infected cattle and swine brought directly from the slaughterhouses, and without having been submitted to any preparation. All except two succumbed. The speaker went on to prove that the two virus were infectious, but that in general that of the bovine was the most virulent. Mr. Gratia then went into cases of infection to man by ingestion—through drinking milk obtained from tuberculous cows. It has been said that in some of these cases tuberculosis might come from other sources.

Finally M. Gratia concluded as follows:—That the human tuberculosis and that of domestic animals form one and the same morbid species, due to one and the same microbe, the bacillus of Koch.

Professor ARLOING, of Paris, next spoke. He examined the results of inoculations that he had conducted, and submitted, in support of his observations, some photographs of inoculated animals taken both before and after infection. He concluded in the same manner as the two preceding speakers by vigorously inviting the specialists to pursue the struggle against bovine tuberculosis, not only for the danger to man, but also to avoid contagion among the bovine species.

M. KOSSEL, a pupil of Koch, much esteemed in Germany, gave a discourse in German. Without being so categorical as the preceding speakers, he argued that the tuberculous bacilli belong to one species but they differ obviously by their virulence. He said that if animals, inoculated with human virus had resisted death, tuberculous lesions perfectly characteristic had however been produced. According to M. Kossel, more experiments were indispensable in order to obtain a final decision.

M. LIGNIERES, Director of the Bacteriological Laboratory of Buenos Ayres, asserted in his turn that tuberculous bacilli in man, in animals, and in birds are of the same substance. They are derived from the same ancestor, but they differ in virulence and in cultures. To well establish these differential characters it is necessary to examine the bacilli such as they are found; present bacteriology does not do that. They are only used after having been mutilated. Inoculate cattle with human bacilli, without mutilation, a local lesion would be the result, which always reacts to tuberculin. The speaker asserted that all microbes, whatever they might be, have certain fixed specific characteristics which serve to determine them. He quotes, finally, a case which he witnessed: bacilli of intestinal tuberculosis taken from a child and inoculated into a guinea-pig, showed the same results as the bovine bacillus. Like M. Arloing he is of opinion that the measures taken with regard to bovine tuberculosis should be maintained, thus averting the danger of contagion among animals.

A German delegate believed, from personal experiments, that human and bovine tuberculosis are not of different species, but really are varieties of one species. He moved that a strict supervision be made as to the control of milk and flesh for consumption.

M. PERRONCITO, Professor at Turin, recalled the fact that in 1868 he had already demonstrated that bovine tuberculosis was identical with human tuberculosis, but he was equally of opinion that there are varieties of virulence and diverse types. What confirmed his way of thinking, was his own experiments performed on pigs, when he obtained special types of tuberculosis, but with a very perceptible difference. He noticed in these experiments the same lesions that are found in bovine tuberculosis, but the bacilli were more numerous on account of the particular quality of the cells.

Another German delegate, whose name is not known to us, energetically supported Koch's assertion.

A French delegate, Sanitary Inspector to the Northern Province, drew the attention of the meeting to the dreadful percentage of cattle attacked with tuberculosis. No one disputes the fact; but according to him the figures given are far below the actual amount. He has been convinced of it in his province after several inquiries had been made. He had demanded that strict measures should be taken as to the regulation of the sale of milk where the danger is very great and not revealed in its aspect.

Professor CHAUVEAU, of Paris, declared that he had always been convinced that human tuberculosis and bovine come from one common stock, and that the one could be transmitted to the other. He quoted an experiment which he made. He introduced into the throat of a bull tuberculous matter produced from a child attacked with intestinal tuberculosis, and he obtained an unquestionable result: a decided pulmonary tuberculosis.

M. DE JONGH remarked that from experiments made by M. Kossel, it results that one succeeds perfectly well in infecting cattle with human bacillus, not rarely, as is generally believed, but frequently. He also replied to the speaker who defended Koch's argument that morning, that he was contradicting Koch himself. The speaker went on to ask, that in a meeting of that kind, the question of laboratories should be set aside, and that strong measures should be taken against bovine tuberculosis and the products which are affected by it.

M. ARLOING observed that MM. Koch and Schutz grant to the adversaries of their theory that in certain cases bovine tuberculosis might be transmitted to man

The speaker then returned briefly to the subject of the variety of the bacillus, and said that the discussion showed only a simple question of shade which separated the partisans and the adversaries of transmissibility. A very confused discussion then took place upon the drawing up or wording of a resolution. Finally they agreed upon the following terms: "Tuberculosis is particularly transmissible from man to man. Nevertheless, as far as our present knowledge goes, this Congress considers that it is necessary to maintain and prescribe hygienic measures against the transmission of animal tuberculosis to the human species.

EXPERIMENTS ON ANIMALS.

By Stephen Paget.

The purpose of this article is to answer the questions—(1) What have these experiments done for physiology? (2) What have they done for the study and treatment of disease? (3) What amount of pain do they give to animals, in our own country, and at this present time?

Physiology.

The circulation of the blood, the blood-pressure, the collateral circulation, and the registration of the blood-pressure, were all of them made out by the help of experiments on animals. (Galen, Realdus, Harvey, Malpighi, Hales, Hunter, Poiseuille, Marey). So were the lacteals, the thoracic duct, and the lymphatic system. (Asellius, Pecquet, Rudbeck, and others). So were the gastric juice (Valisnieri, Réaumur, Spallanzani, Tiedemann, and Gmelin), the glycogenic action of the liver (Bernard), the secretions of the pancreas (de Graaf, Bernard, von Mering, Minkowski, and others), and the method of growth of the bones (du Hamel, Bichat, Syme, Stanley, Ollier). The whole physiology of the nervous system is founded on experiments on animals: on the work of Sir Charles Bell, Magendie, and Marshall Hall; after them, Flourens, Bernard, Fritsch and Hitzig, Ferrier and Yeo, Horsley and Beevor, and others. The problems of animal heat, and of respiration, and of muscular action, and of the sympathetic system, have all of them been solved, so far as men can solve them, by the help of such experiments; and it is the same with all the physiological chemistry of the human body. "I am fully convinced," said Mr. Darwin to the Royal Commission in 1875, "that physiology can progress only by the aid of experiments on living animals. I cannot think of any one step which has been made in physiology without that aid."

Study and Treatment of Disease.

It is a long list of the diseases which have been studied by the help of experiments on animals. Among them are inflammation, suppuration, and "blood-poisoning" (Wharton, Jones, Waller, and Cohnheim, Metschnikoff, Pasteur, Lister, and others); plague and cholera (Kitasato, Yersin, Koch, Haffkine); malaria, yellow fever, and filariasis (Ross, Finlay, Sanarelli, Durham, and Myers); typhoid fever and Malta fever (Klebs, Eberth, Wright, and Semple, Widal, Bruce); anthrax, rouget, and tetanus (Koch, Pasteur, Roux, Thuillier, Nicolaier, Sidney Martin, and others); rabies, diphtheria, tubercle, pernicious anæmia, myxœdema, and the diseases due to internal parasites; and, beside all these and other diseases, the action of drugs, and the nature of snake-poisons. Again and again experiments on animals have thrown a whole flood of light on disease; for example, Villemin's inoculation of tubercle, Nicolaier's work on tetanus, the work of Ross, and of Haffkine, and of Pasteur. So much for pathology; now for practice.

Of course, there are many practical measures, founded more or less on experiments on animals, that must only be named in this short article; the transfusion of saline solution, artificial respiration, the hypodermic use of drugs, the inhalation of oxygen, the torsion of arteries, the use of the absorbable ligature, skin-grafting and bone-grafting, and the uses of electricity for the diagnosis and treatment of many diseases or injuries of the nervous system. Let us take a wider view, and consider four instances: diphtheria, malaria, and yellow fever, Pasteur's work, and Lister's work.

1. Diphtheria.—In 1890 Behring and Kitasato succeeded in immunising animals against diphtheria, and in curing infected animals by the use of an antitoxin; and the first cases treated with antitoxin were published in 1893. Between then and now it has saved in all parts of the world at least a quarter of a million of children in ten years, who would otherwise have been poisoned or choked to death. It is also used with excellent results for the protection of those who are in immediate risk of infection; but this protective or preventive use of the antitoxin is, of course, a matter of emergency in this or that household; there will still be variations in the national death-rate from the disease; and the antitoxin cannot prevent a bad diphtheria year any more than an umbrella can prevent a wet day. It is a question not of the number of cases, but of the case mortality—*i.e.*, the proportion of deaths to cases. Here, for one instance out of a legion of them, is the case mortality of diphtheria at the hospitals of the Metropolitan Asylums Board:—

Without Antitoxin.		With Antitoxin.	
1889	40·74 p.c.	1895	22·55 p.c
1890	33·55 „	1896	20·80 „
1891	30·63 „	1897	17·50 „
1892	29·35 „	1898	15·50 „
1893	30·42 „	1899	13·95 „
1894	29·64 „	1900	12·01 „

And this saving of lives wholesale goes on, year in, year out, in every country of the civilised world, and in epidemics of diverse intensities. A writer in *The Daily News* (August 26) tries to evade this fact by quoting the "Medical Brief," and by giving one or two references that are nine years old.

2. *Malaria and Yellow Fever.*—The discovery that the bite of the mosquito can carry with it the germs of malaria, or of yellow fever, or of filariasis (or, perhaps, of dengue), was made by the help of experiments on animals. The reports of the Liverpool School of Tropical Medicine, and the reports from Cuba since the American occupation, and the reports from Staten Island and from the West Coast of Africa, give some faint idea of the importance of this discovery.

3. Pasteur's work must, of course, be studied in M. Valléry Radot's "Life of Pasteur." Many millions of animals have been protected against anthrax and rouget; the loss of sheep from anthrax has fallen from 10 per cent. to 1 per cent.; the loss of cattle from 5 to 1 per cent.; of swine, from rouget, from 20 per cent. to 1½ cent. With regard to rabies (hyrophobia), if it be taken in time the mortality among those bitten by animals that have been absolutely proved, by the inoculation of test animals, to have been rabid, is less than 1 per cent. In the days before Pasteur it was at least 10 per cent.

4. Lister's work must be studied not only in the formal operations of surgery, but in the treatment of all dirty or infected wounds and sores, abscesses, compound fractures, compound dislocations, and septic processes; in the saving of lives and of limbs, in the avoidance of pain and fever, and in the more rapid recovery of cases.

It would be easy to add to these four instances. All physiology, and all medicine, and all surgery, have become what they are by the help of experiments on animals; and without these experiments millions of lives, human and animal, would have been lost that have been

saved. There is not one opponent of them who has not good reason to be thankful for them.

ACT 39 AND 40 VIC., C. 77.

The text of the Act, and the annual reports to Government, can be got for a few pence from Messrs. Eyre & Spottiswoode, East Harding Street, E.C. The latest Report, for 1902, must suffice here; and the Report from Ireland may be omitted, as only 65 experiments were made in Ireland, and all of them, except six, were of the nature of inoculations or injections.

In England and Scotland during 1902 the total number of experiments was 14,906. Of these no less than 12,776 were of the nature of inoculations. That is to say, six out of seven experiments. "They are mostly inoculations," says the report, "but a few of them are feeding experiments, or the administration of various substances by the mouth, or the abstraction of a minute quantity of blood for examination."

"In no case has a cutting operation more severe than a superficial venesection been allowed to be performed without anæsthetics."

"It must not be assumed that the animal is in pain during the whole of this time (after inoculation). In cases of prolonged action of an injected substance, even when ending fatally, the animal is generally apparently well, and takes its food as usual, until a short time before death. The state of illness may last only a very few hours, and in some cases it is not observed at all. In a very large number of the experiments the results are negative, and the animals suffer no inconvenience whatever from the inoculation. In the event of pain ensuing as the result of an inoculation, a condition attached to the licence requires that the animal shall be killed under anæsthetics as soon as the main result of the experiment has been attained."

"Attention may especially be directed to the large numbers (of inoculations) performed for the preparation of remedies, and on behalf of various public authorities. Five licensees performed 3,857 inoculation experiments for the testing of antitoxins. Seventeen licensees report together 3,997 inoculation experiments, nearly the whole of which were performed for official bodies, including the Local Government Board, the House of Commons Ventilation Committee, the Royal Commission of Tuberculosis, the Board of Agriculture, several County Councils, and many Municipal Corporations. The experiments comprised a very large number for the purpose of testing milk for tuberculosis, others for ascertaining whether hair is infected with anthrax, for the examination of sewage and atmospheric air, and the like. Numerous inoculations are required also for the diagnosis of disease in man and animals; and many are performed in the course of the cancer-investigations, now in progress in several places."

We have next to consider those experiments, 2,130 in all, performed under an anæsthetic. Of the majority of them, 1,185 in all, the report says that they "are unattended by pain, because the animal is kept under an anæsthetic during the whole of the experiment, and must, if the pain is likely to continue after the effect of the anæsthetic has ceased, or if any serious injury has been inflicted on the animal, be killed before it recovers from the influence of the anæsthetic."

Of the minority, 945 in all, the report says: "The initial operations are performed under anæsthetics, from the influence of which the animals are allowed to recover. The operations are performed aseptically, and the healing of the wounds, as a rule, takes place without pain. If the antiseptic precautions fail, and suppuration occurs, the animal is required to be killed. Experiments involving the removal of important organs, and even of parts of the brain, are performed without causing pain to the animals; and after the section of a part of the nervous system, the resulting degenerative changes are painless. In the event of a subsequent operation being necessary, a condition is attached to the licence requiring all operative procedures to be carried out under anæsthetics of sufficient power to prevent the animal feeling pain."

SUMMARY.

We can fairly try to estimate the pain involved in these experiments. Six out of seven of them were of the nature of inoculations. Many of these inoculations gave a negative result, *i.e.* nothing at all happened. In other cases they caused disease and death, such as must come to all animals, wild or tame. A pet rabbit, or a pet guinea-pig, that dies of tuberculosis has neither more nor less pain than a similar animal inoculated with the tubercle bacillus.

In the 1,185 animals, the amount of pain hardly comes to be considered. They may fairly be compared with a like number of animals killed for sport or for food.

The 945 animals may fairly be compared with the same number of pet animals submitted to operation at the hands of a skilful veterinary surgeon, and under an anæsthetic; with this difference, that many of them lost health after the operation, or suffered some disease or disablement and so died or were killed. But it is not allowed in these cases, after the anæsthetic had passed off, to make any further experiment on the animal without an anæsthetic.

If anybody will only take the trouble to read the Act and the Reports to Government, and to consider the vast multitudes of lives that are saved in every part of the world by methods that were discovered by the help of experiments on animals, he will not wonder that the opposition to these experiments comes to nothing, and in a quarter of a century has accomplished practically nothing. Last year, out of all experiments made in the United Kingdom, 85 per cent. were of the nature of inoculations. Of these more than 60 per cent. were for the testing of medicines, or for similar measures involving the national health. That is to say, bacteriology is a branch of the public service just like the police force. And, along with bacteriology, there are physiology, pathology, and common every day medicine and surgery. By the help of experiments on animals they have reached their present stage; and it is by the help of this method that they will reach something better still.—*The Daily News.*

A DECADE OF GILRUTH, SCIENTIST.

Yesterday's proceedings at the Dairy Conference were marked by an able paper by a layman upon our dairy industry; to-day's proceedings were lifted high above the ordinary plane of such conferences by a most valuable and illuminative scientific paper by Mr. J. A. Gilruth, Government Bacteriologist. We give at some length in another column a review of Mr. Gilruth's paper, in which he sets forth in popular terms, easily "understanded of the people," a number of the diseases which most beset the agriculturist, pastoralist and dairy farmer. There is no theory about Mr. Gilruth, Scientist. He is a man of deeds rather than words. For ten years he has been hunting the wily microbe with an enthusiasm which only a Scotchman or Frenchman could put into scientific investigation. He, himself, in his paper, gives credit to the great and valuable researches of a great Frenchman, Pasteur, regarding anthrax. We unhesitatingly say—despite the large compliment it conveys to our own investigator—that what Pasteur has been to France, Gilruth has been to New Zealand, and it was a splendid day for the producers of this colony when his services were received by our Department of Agriculture. The scientific man, as a rule, is generally hedged in by a multitude of technical phrases, which enclose him, as it

were, in a magic circle of mystery, but Mr. Gilruth is an exception. He can set forth the most abstruse bacteriological subject in such language, whether written or oral, as to be well understood by laymen interested in the particular subject he is referring to. This fact is plainly evident in the paper read this morning by Mr. Gilruth, a paper which, when printed and distributed by the National Dairy Association, should cause everyone living upon or from the land to "read, mark, learn, and inwardly digest" its contents with the closest attention and study. We congratulate the Association upon having prompted the writing of such a paper, and we compliment Mr. Gilruth, Scientist, upon the great and deserved success which has marked his decade's work on behalf of scientific investigation in New Zealand.—*The Manawatu Evening Standard*, Thursday, July 30th.

Veterinary Surgeons and Jury Service.

At the Hedon Petty Sessions, on September 23rd, a novel point was raised.

Mr. T. B. Johnson, the assistant overseer, attended the court with the jury list, and said it contained the names of all persons entitled to serve, but that Mr. Henry Edward Richardson, M.R.C.V.S., claimed freedom and exemption on the ground that he was a medical practitioner.

Mr. Alan-Park (Magistrates' Clerk): I believe there is no decision on this point in an English court, but there is an Irish case. You have had a long experience as assistant overseer Mr. Johnson, have you gone into the matter?

Mr. Johnson: No, sir, I have not, but in the Irish case, where exemption was refused, the veterinary surgeon declined to attend a jury on which he was summoned, and was fined £2 for contempt of Court. He appealed, and finally in the Court for Crown Cases Reserved in Dublin on the 4th July, 1903, it was decided that the petitioner, being a "licensed medical practitioner" was entitled to the freedom and exemption he claimed.

Mr. Park: This is in Ireland, and another point arises. The Irish Diploma says "licensed medical practitioner," the English one "registered medical practitioner."

Mr. H. H. Ayre (Chairman of the Bench) said he thought the terms were synonymous, and though it was an important point, he felt in the face of the Irish decision that Mr. Richardson was entitld to the relief he sought. The Bench ordered that the name of Mr. Richardson be struck off the list.—*Yorkshire Post.*

Serious Accident to a V.S.

Mr. HENRY SMITH, the well-known veterinary surgeon, was driving along Goring Road about half-past eleven o'clock yesterday morning when his horse shied at a passing motor car, and the sudden jerk broke a shaft and precipitated Mr. Smith's assistant on to the roadside. The horse then bolted with Mr. Smith in the trap, his attempts to get out being unsuccessful. After proceeding some distance the gig overturned, and he was thrown heavily on his head, sustaining severe injuries, which, as far as can be ascertained at present, comprise concussion of the brain, a fracture of the right collar bone, and broken ribs, in addition to severe cuts. The trap was smashed. Mr. Smith was conveyed to his home in Chapel Road, and is progressing as well as can be expected.—*The Worthing Gazette.*

Personal.

Mr. W. E. TAYLOR, M.R.C.V.S., of Taunton, who was well known as a practitioner in London before the South African War, has received the medal and four clasps for his services as C.V.S. in the campaign.

ARMY VETERINARY DEPARTMENT.

Extract from *London Gazette*,

WAR OFFICE, PALL MALL, Sept. 18.

I.Y.—CITY OF LONDON (ROUGH RIDERS).—J. W. Whitecross, F.R.C.V.S., to be Vet.-Lieut.

DISEASES OF ANIMALS ACTS 1894 & 1896.

SUMMARY OF RETURNS, WEEK ENDING SEPTEMBER 19, 1903.

Period.	Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy)		Rabies.		Swine Fever.	
							Cases Confirmed.			
	Outbreaks	Animals Attacked.	Outbreaks.	Animals Attacked.	Outbreaks.	Animals Attacked.	Dogs.	Other Animals	Outbreaks.	Slaughtered as Diseased or Exposed to Infection
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Week ended September 19, 1903 ..	11	17	..	..	24	54	..	..	25	253
Corresponding week in 1902 ..	11	14	..	..	25	37	..	..	28	145
Corresponding week in 1901 ..	15	26	..	..	31	51	..	..	29	154
Corresponding week in 1900 ..	13	14	2	6	29	42	1	1	18	67
Total for 38 weeks, 1903	583	886	..	..	1121	1863	..	..	1170	6,063
Corresponding period in 1902 ..	510	815	1	120	865	1535	12	11	1,292	5,930
Corresponding period in 1901 ..	464	659	12	669	1018	1743	1	1	2,763	13,450
Corresponding period in 1900 ..	404	706	16	225	837	1386	2	1	1,565	15,100

NOTE.—The figures for the Current Year are approximate only.

Board of Agriculture, Sept. 22nd, 1903.

CORRESPONDENCE.

BLACK QUARTER VACCINE.

Sir,

In reply to your enquiry as to results of vaccination against Blackleg I am pleased to be able to state that up to the end of August I have heard of only five deaths from Blackleg after 400 vaccinations with the Pasteur Blacklegine (single). Three of these died within a week after vaccination and were on farms—two on one and one on another—where they had just previously lost some calves from the disease. One died a month after the operation and another 3 months afterwards. This latter case rather shook my faith in vaccination, but the percentage of deaths is so small compared with previous methods that the use of Blacklegine is indicated most strongly where the disease exists.—Yours obediently,

A. J. DOWN.

Sampford Peverill, Nr. Tiverton, Devon.
Sept. 19th.

COMMUNICATIONS, BOOKS AND PAPERS RECEIVED.—Messrs. E. Morgan, G. H. Locke, J. H. Welsby, A. J. Down.
The Agricultural Journal (Cape), *The Manawatu Evening Standard*, *C. P. A. Monthly Magazine*, *The Worthing Gazette*.

Veterinary Societies—Addresses.

Alterations for this list must be duly notified by the Secretaries

BORDER COUNTIES V.M.S.
Pres: Mr. J. W. Hewson, M.R.C.V.S., Wigton
Hon. Sec. (pro tem.): Mr. F. W. Garnett, M.R.C.V.S., Dalegarth, Windermere
Meetings, Second Friday of Feb., June, and October

CENTRAL V.M.S.
Pres. Mr. W. Perryman, M.R.C.V.S., 139 Fentiman-road, S.W.
Hon. Sec. Mr E. Lionel Stroud, F.R.C.V.S., 29 Spring-st., Hyde Park, W.
Meetings, First Thursday in each month, except August and September, 10 Red Lion Square. Holborn, at 7 p.m.

CENTRAL V.A. OF IRELAND.
Pres. Mr. M. J. Cleary, M.R.C.V.S., Kilpatrick, Mullingar
Hon. Sec: Mr J. J. Vahey, M.R.C.V.S., Balliurobe
Treas: Mr. J. F. Healey. M.R.C.V.S., Midleton

EASTERN COUNTIES V.M.A.
Pres: Mr. Fred. Morton Wallis, M.R.C.V.S., Halstead, Essex
Hon. Sec.: Mr. H. P. Standley, M.R.C.V.S. Wymondham
Meetings, Second Tuesday, Feb. and July

GLASGOW V.M.S.
Pres. Principal McCall.
Hon. Sec. Mr. Walter Gardner

VET. MED. ASSN. OF IRELAND.
Pres: Mr. Chas. Allen, F.R.C.V.S., 35 North Frederick st., Dublin
Hon. Sec. Mr. J. McKenny, M.R.C.V.S. 116 Stephens-green-west, Dublin

LANCASHIRE V.M.A.
Pres: Mr. R. Hughes, F.R.C.V.S., Oswestry
Hon. Sec.: Mr. G. H. Locke, M.R.C.V.S. Grosvenor-street, Manchester
Meetings, 1st Thursday in April, June, Sept., & Dec.

LINCOLNSHIRE V.M.S.
Pres. Mr. H. Caulton Reeks, F.R.C.V.S., Spalding
Hon. Sec: Mr. T. Turner, M.R.C.V.S., Sleaford
Treas: Mr. E. C. Russell, M.R.C.V.S., Grantham
Meetings, Second Thursday, Feb., June and October

MIDLAND COUNTIES V.M.A.
Pres: Mr. Frank H. Gibbing, F.R.C.V.S., Nottingham
Hon. Sec: Mr. H. J. Dawes, F.R.C.V.S., Camden House, High-st., West Bromwich
Meetings, Second Tuesday, Wednesday, Thursday, and Friday alternately in Feb., May, Aug. and Nov.

NATIONAL VET. ASSOCIATION.
Pres: Mr. C. Allen, F.R.C.V.S., North Frederick-st., Dublin
Sec: Mr. William Hunting, F.R.C.V.S.
Treas: Mr. F. W. Wragg, F.R.C.V.S., Whitechapel, London.

NATIONAL VETERINARY BENEVOLENT & MUTUAL DEFENCE SOCIETY.
Pres: Mr. W. A. Taylor, F.R.C.V.S., Tower-st, Manchester
Treas: Mr. E. Faulkner, F.R.C.V.S., Manchester
Hon. Sec: Mr. Sam. Locke, M.R.C.V.S. Grosvenor Street, Oxford-st., Manchester

NEW SOUTH WALES V.M.A.
Pres: Mr. John Stewart, H. AND A.S.
Vice: Mr. John Pottie, H. and A.S.
Hon. Sec. & Treas: Mr. J. D. Stewart, M.R.C.V.S.

NORTH OF ENGLAND V.M.A.
Pres: Mr. G. Craik, M.R.C.V.S., Alnwick
Hon. Sec: Mr. E. R. Gibson, M.R.C.V.S. 25 Marlborough-street, Seaham Harbour
Meetings, Third Friday, Feb., May, Aug. and Nov.

NORTH OF SCOTLAND V.M.S.
Pres: Mr. J. McLauchlan Young, F.R.C.V.S., Univ. Aberdeen
Sec. & Treas: Mr. Clement Baxter, M.R.C.V.S., Elgin

NORTH WALES V.M.A.
Pres: Mr. H. O. Richard, M.R.C.V.S., Corwen
Hon. Sec. O. Trevor Williams. M.R.C.V.S., Llangefni
Meetings, First Tuesday, March and September

ONTARIO V.A.
Pres: Mr. J. H. Tennent, V.S., London, Ontario
Sec: & *Treas*: Mr. C. H. Sweetapple, V.S., Toronto, Ontario

ROYAL COUNTIES V.M.A.
Pres: Mr. James East, M.R.C.V.S., Aylesbury
Hon. Sec: Mr. Percy J. Simpson, M.R.C.V.S., Kendrick House, Maidenhead
Meetings, Last Friday, Feb., June and Nov.

ROYAL SCOTTISH V.S.
Pres: Mr. Reid, M.R.C.V.S, Auchtermuchty.
Hon. Sec: Mr. W. D. Fairbairn, M.R.C.V.S., Cupar, Fifeshire

ROYAL VETERINARY COLLEGE M.A.
Pres: Prof. Woodruff
Hon. Sec: Mr. W. H. Chase, M.R.C.V.S.
Assist. H.S. Mr. Guy Sutton

SCOTTISH METROPOLITAN V.M.S.
Pres: Mr. John Connochie, M.R.C.V.S., Aytoun
Hon. Sec: Mr. John Aitken, Junr., M.R.C.V.S., Dalkeith

SOUTH DURHAM AND NORTH YORKSHIRE V.M.A.
Pres.: Mr. E. H. Pratt, M.R.C.V.S., Northallerton
Hon. Sec: Mr. W. Awde, F.R.C.V.S., Stockton-on-Tees.
Meetings, First Friday, Mar., June, Sept. and Dec.

SOUTHERN COUNTIES V.M.S.
Pres: Mr. C. Pack, M.R.C.V.S, Lymington
Hon. Sec: Mr. F. Spencer, M.R.C.V.S., Claremont House, Basingstoke
Hon. Treas: Mr. E. W. Baker, M.R.C.V.S., Wimborne
Meetings, Last Thursday, Mar., June and Sept.

TRANSVAAL V.M.A.
Pres: Capt. Irvine Smith, South African Constabulary
Hon. Sec: Mr. Kirby Pilkington, M.R.C.V.S., Johannesburg

WESTERN COUNTIES V.M.A.
Pres: Mr. W. Ascott, M.R.C.V.S., Bideford
Hon. Sec. & Treas: Mr. P. G. Bond, M.R.C.V.S., Plymouth
Meetings, Third Thursday, March, July and November

WEST OF SCOTLAND V.M.A.
Pres: Dr. James McIntosh McCall, Vety. Coll. Glasgow
Hon. Sec: & *Treas*: Mr. J. Bishop, M.R.C.V.S., 754 Garscube Road, Glasgow

YORKSHIRE V.M.A
Pres: Mr. A. C. Thompson, M.R.C.V.S., Doncaster
Treas: Mr. J. E. Scriven, M.R.C.V.S., Tadcaster
Hon. Sec; Mr. H. G. Bowes, M.R.C.V.S., 6 De Grey-ter. Leeds
Meetings, Last Friday in Jan., April, and October, and a Thursday in July.